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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,407	07/30/2003	Toshihiro Sunaga	1232-5088	9015
27123	7590	04/11/2005	EXAMINER	
MORGAN & FINNEGAN, L.L.P. 3 WORLD FINANCIAL CENTER NEW YORK, NY 10281-2101			KOVAL, MELISSA J	
			ART UNIT	PAPER NUMBER
			2851	

DATE MAILED: 04/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

2K

<b>Office Action Summary</b>	<b>Application No.</b> 10/630,407	<b>Applicant(s)</b> SUNAGA ET AL.	
	<b>Examiner</b> Melissa J. Koval	<b>Art Unit</b> 2851	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 October 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,5,7,12,13,17 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 4,6,8-11,14-16,18-21 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>October 22, 2004</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5, 7, 12, 13, 17, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Akiyama U.S. Patent 6,120,156.

With respect to the claims refer to Figure 10 of '156, for example.

Claim 1 sets forth: "A projection optical system which projects luminous flux from an image forming element which forms an original image onto a projection surface (See column 1, lines 9 through 15 of '156.), and has a reference axis which is defined as a path of a central principal ray which is a principal ray of luminous flux from the center of the original image to the center of an image of the original image projected on the projection surface (See column 6, lines 49 through 53, and column 7, lines 11 through 19 of '156.), the reference axis on an incident side and the reference axis on an emerging side of the projection optical system are being oblique to each other (As shown in Figure 10 of '156, the dot-and-dash line impinges on reflective surface R3 at an angle oblique to which the dot-and-dash line emerges from transparent surface R6, after traveling through its optical path.), the projection optical system comprising:

a plurality of reflecting surfaces including at least three reflecting surfaces (reflective surfaces R3, R4 and R5), each of the surfaces having a curvature (One can

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see from observing Figure 10 that surfaces R3, R4 and R5 are curved. Also refer to the SUMMARY OF THE INVENTION wherein curved surfaces are discussed.), wherein the plurality of reflecting surfaces are arranged such that the reference axis has at least one intersection in the projection optical system (One can clearly see a crossover in the path of the dot-and-dash line near reference numeral D2 in Figure 10.)."

Claims 13, 17 and 22 are rejected for the same reasons already applied to rejected claim 1 above.

Claim 2 sets forth: "The projection optical system according to claim 1, wherein the reference axis on the incident side forms an angle of 30 degrees or more with the reference axis on the emerging side." See  $\Theta_3$  and particularly the chart describing embodiment 3 in column 14, lines 11 through 35.

Claim 3 sets forth: "The projection optical system according to claim 1, wherein each of the plurality of reflecting surfaces is formed of a mirror." The reflective surfaces described with respect to Figures 1, 2, 7 and 8 are mirrors. The Examiner also believes the reflective surfaces shown in Figure 10 to be mirrors.

Claim 5 sets forth: "The projection optical system according to claim 1, wherein a maximum field angle on the incidence side or a maximum field angle on the emerging side of the projection optical system is equal to or larger than 20 degrees." See  $\Theta_3$  and particularly the chart describing embodiment 1 in column 13, lines 15 through 43.

Claim 7 sets forth: "The projection optical system according to claim 1, wherein the luminous flux from the original image passes through space between at least two reflecting surfaces of the plurality of reflecting surfaces." See Figure 10 of '156.

Claim 12 sets forth: "The projection optical system according to claim 1, wherein at least one of the plurality of reflecting surface is rotationally asymmetric." See column 8, lines 46 through 67, and column 9, lines 1 through 22, of '156.

***Allowable Subject Matter***

Claims 4, 6, 8-11, 14-16, 18-21, and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record neither shows nor suggests the following expression set forth in dependent claim 4:

" $L > 7Y$ "

where L represents a maximum spacing between two adjacent surfaces along the reference axis of the plurality of reflecting surfaces and Y represents a size of the original image in a plane including the reference axis."

The prior art of record neither shows nor suggests the structural limitations introduced in dependent claims 6, 8-11, 14-16, 18-21, and 23. Each and every limitation of dependent claims 6, 8-11, 14-16, 18-21, and 23 renders said claim respectively allowable over the prior art of record.

**Conclusion**

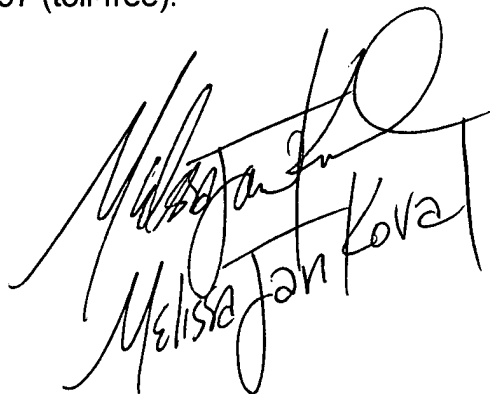
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following reference cited by applicant, U.S. Patent 6,522,475 B2, may also read on at least claims 1 and 17. See Figures 40 and 41 of '475.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa J. Koval whose telephone number is (571) 272-2121. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571) 272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJK



Handwritten signature of Melissa Jan Koval.